



IEC 61850
UNIVERSITY
TRAINING • TESTING • CONSULTING
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TESCO

Increasing the Usability & Interoperability of IEC 61850 via Basic Application Profiles: What Does Your Profile Look Like?

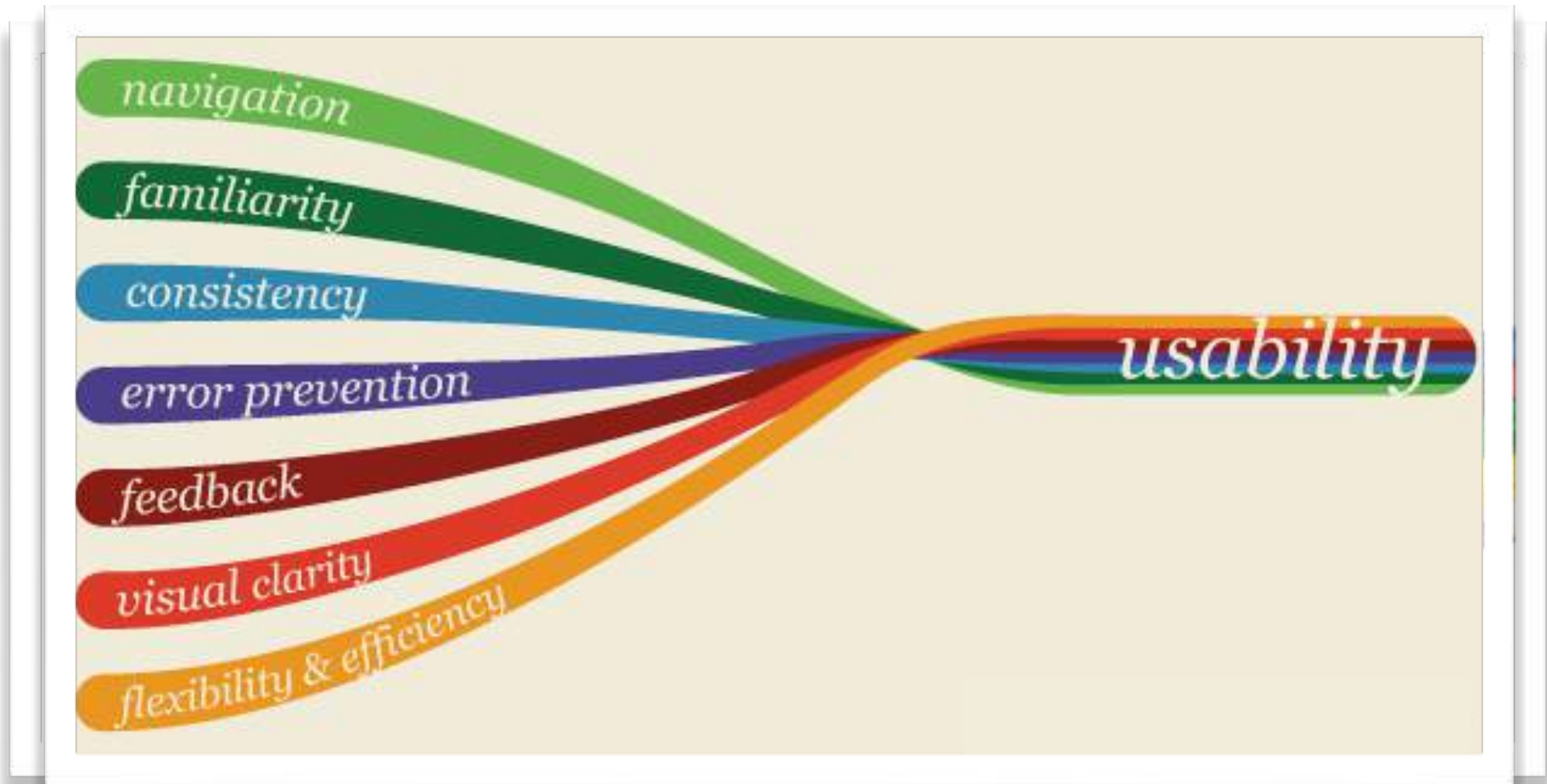
Dustin Tessier, TESCO

August 30, Raleigh, North Carolina

Objective

1. What problems are the BAP's trying to resolve?
2. What is a profile? What types of profiles exist?
Status update on IEC's BAP initiative.
3. What can users be doing today to prepare for BAPs? Wait for IEC to finish? OR proceed with your own user profile?

Common Feedback From End-Users

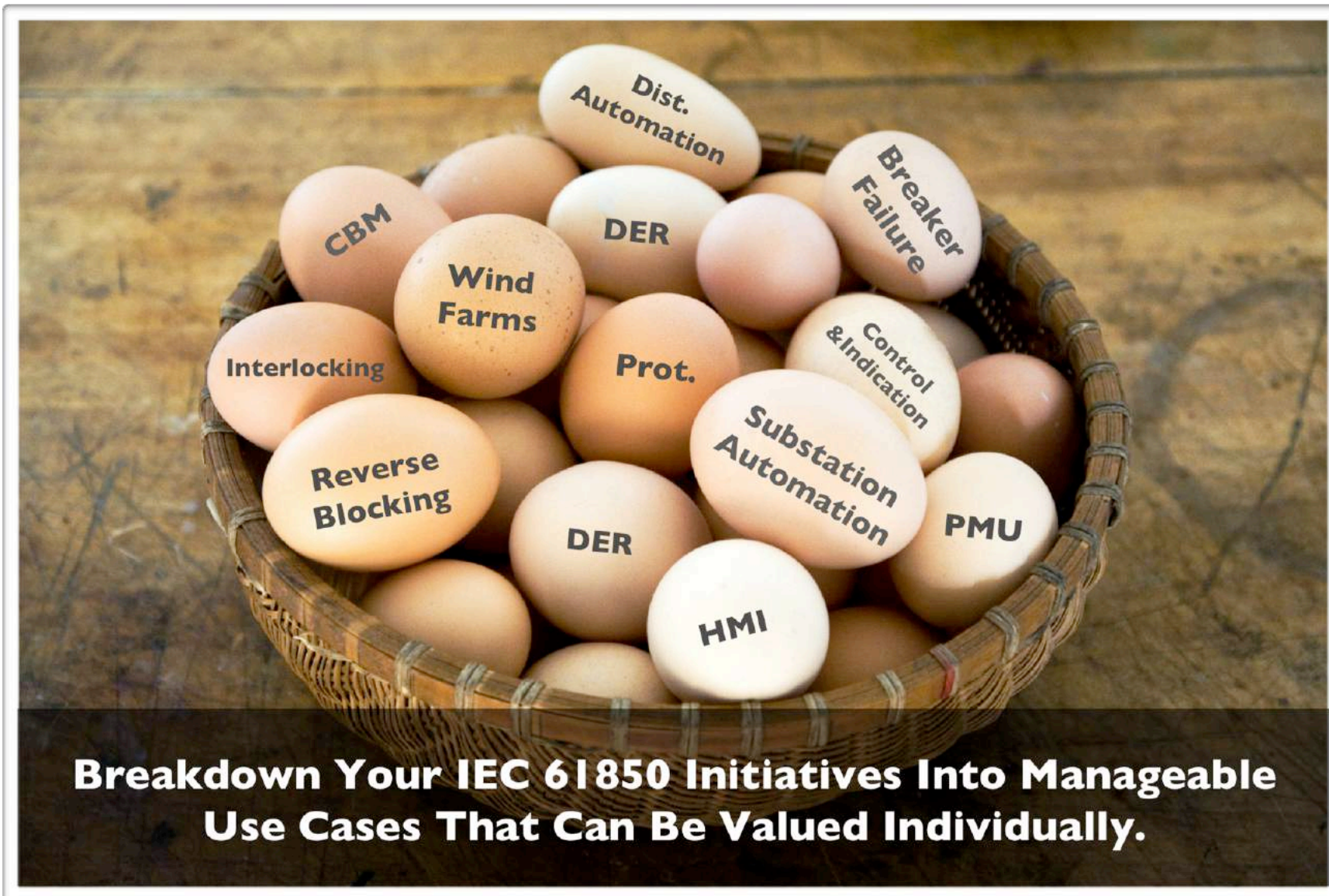


Golden Rule #1



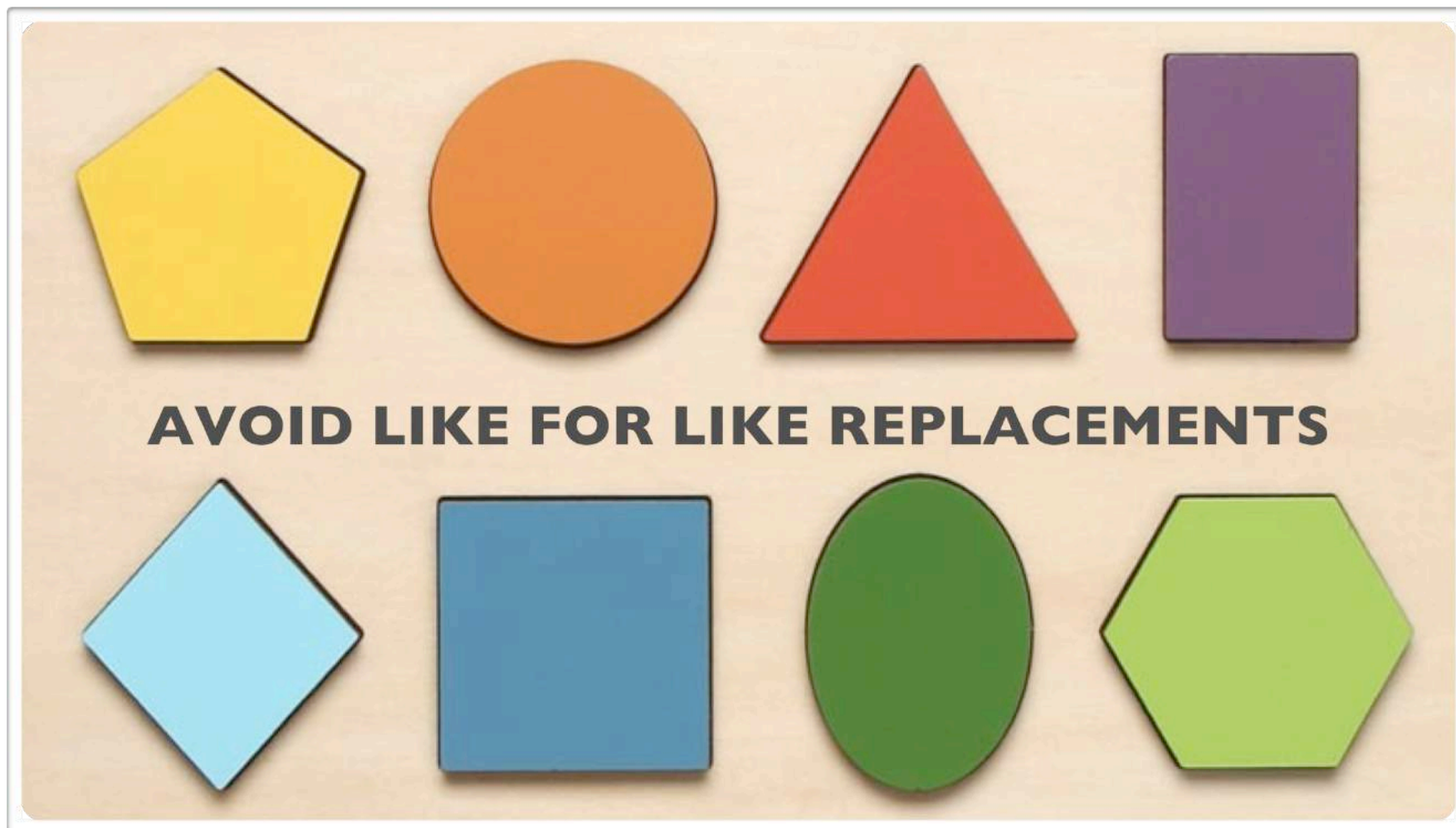
**AVOID MULTIPLE FLAVOURS OF IEC 61850 INTEGRATIONS.
TAKE A STANDARD APPROACH TO APPLYING THE
STANDARD**

Golden Rule #2



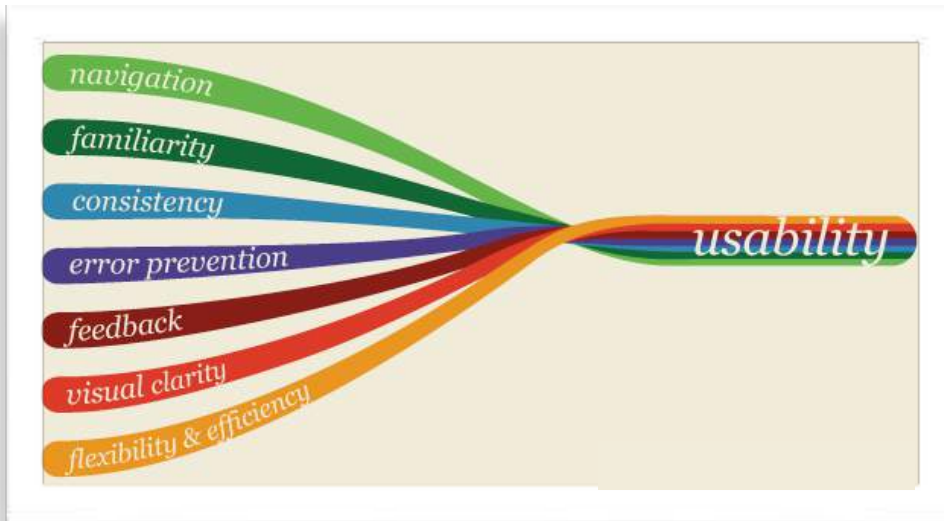
USE CASES ARE BEST DEFINED AS “APPLICATIONS”

Golden Rule #3



DECIDE HOW “BASIC” YOU NEED YOUR APPLICATION TO BE. THE MORE VALUE-ADDED FEATURES THAT ARE REQUIRED FROM YOUR APPLICATIONS, THE LESS “BASIC” THE PROFILE BECOMES.

How do BAP's address these issues?



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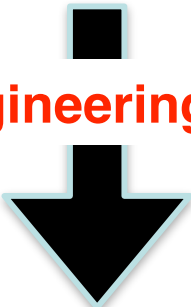
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Current State of Affairs



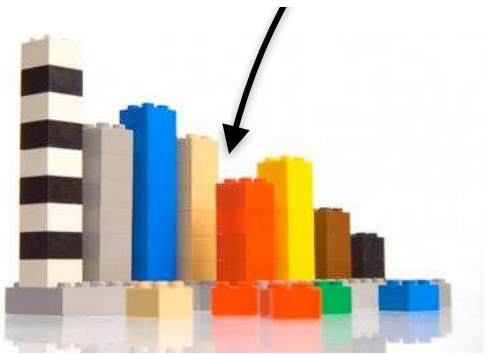
Too much engineering! Too much testing!



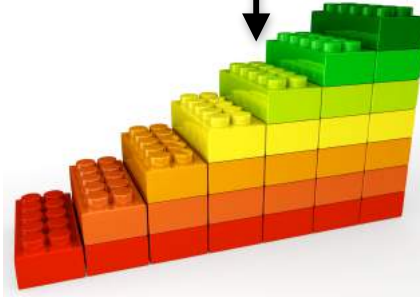
Moving Forward.....



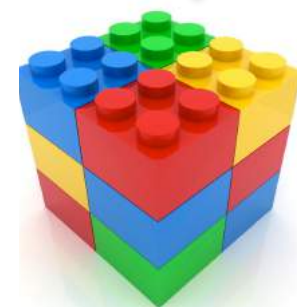
Specified Once - Engineered Once - Tested Once - Replicated Numerous Times



Application Profile #1



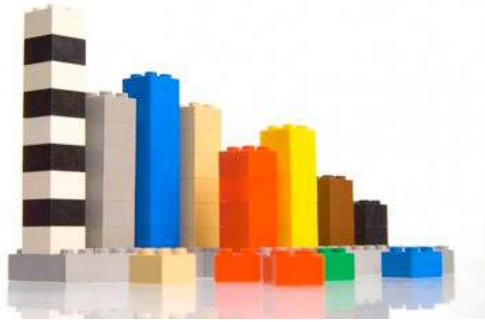
Application Profile #2



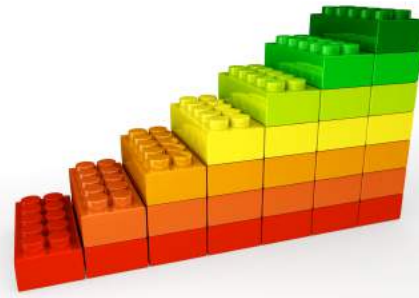
Application Profile ...



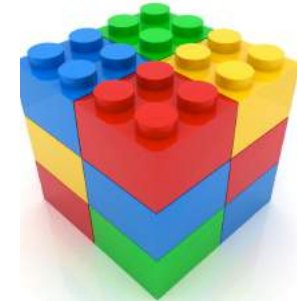
Moving Forward.....



Application Profile #1



Application Profile #2

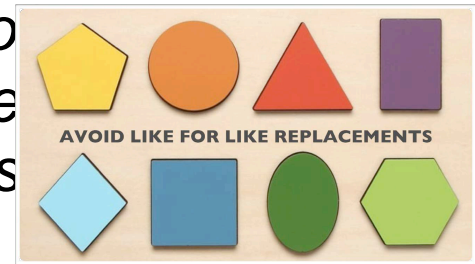


Application Profile ...



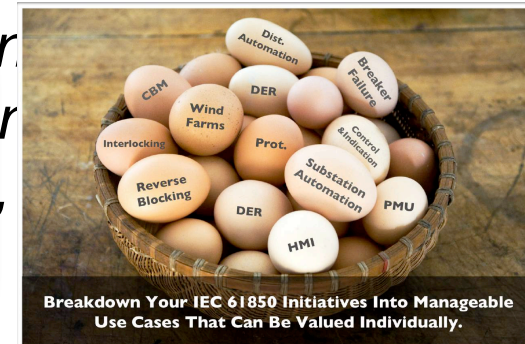
Definition of "Basic"

Common Requirements From a Single User and/or
Among a Group of Users



Definition of "Application"

Protection, Automation, Control Applications



Definition of "Profile"

In the context of standards the term "profile" is commonly

Set of "Rules" Required to
Achieve the Basic Application

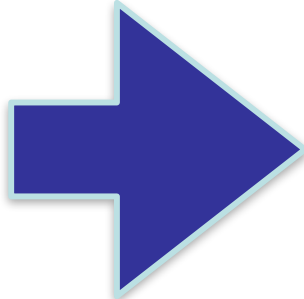


in the domain of power utility automation.



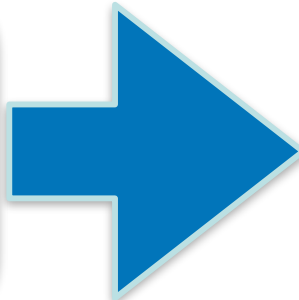
TYPES OF BAP'S

USER PROFILES
(Group/Individual)



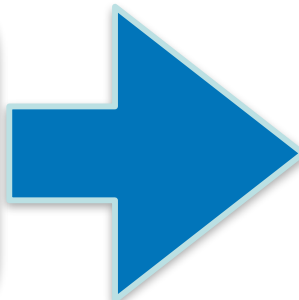
**Global IEC 61850
User Group**

BASIC
APPLICATION
PROFILES



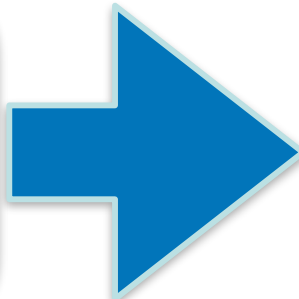
IEC 61850-7-6: Guideline for definition of BAPs (Draft Technical Report)
IEC 62361-103: Standard Profiling (Draft Technical Report)

PRODUCT
PROFILES



Some Examples:
UCA IEC 61850-9-2LE: Ed.1 Process Bus
IEC 61869-9: Ed.2 Process Bus
IEC 61869-13: Merging Unit (Draft)
IEC 61850-9-3: PTP Profile

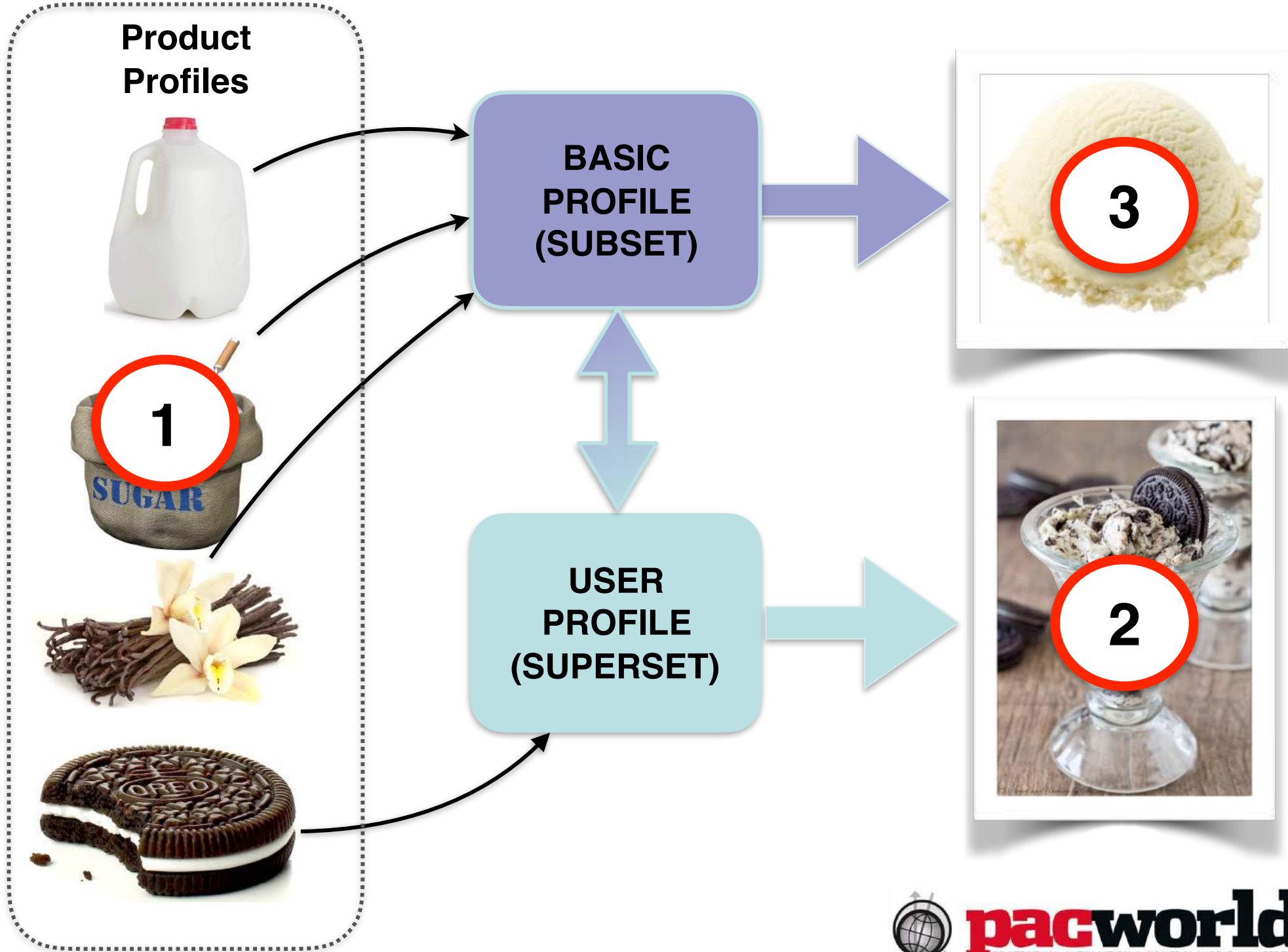
DOMAIN
PROFILES



Domain profiles exist for:

- Substation Automation
- Wind
- Hydro
- DER
- PQ

THE PRINCIPLES OF BAP'S



Content OF BAP'S

● Data Model Requirements

- Logical Devices
- Logical Nodes
- Data Objects & CDCs
- Data Attributes
- Composition of Datasets

● Communication Services

- MMS Services
- Report Control Block Settings
- GOOSE & SMV Control Block Settings
- Sampling Rates & ASDUs

● Fixed Semantics

- Naming of LD, LN Prefix/Instances, Datasets, Control Blocks, etc.

● Accuracy & Performance Classes

- Time synchronization requirements
- Processing delays
- Environmental type test requirements

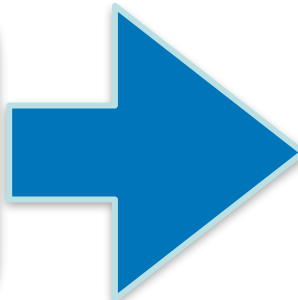
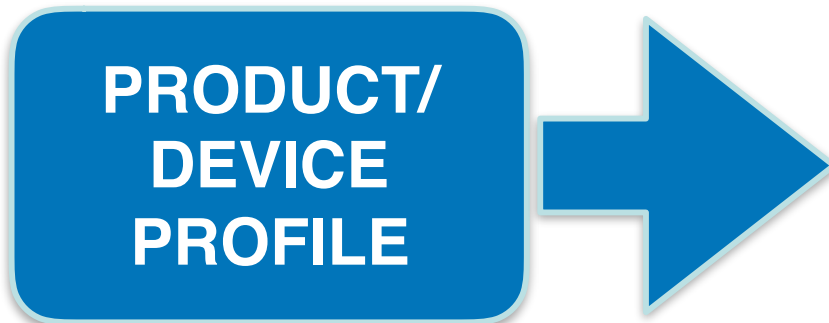
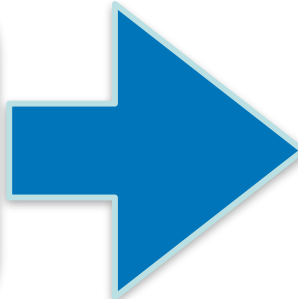
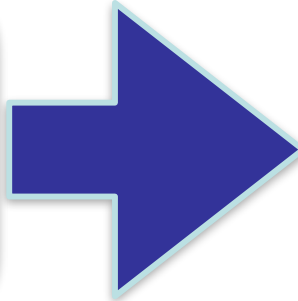
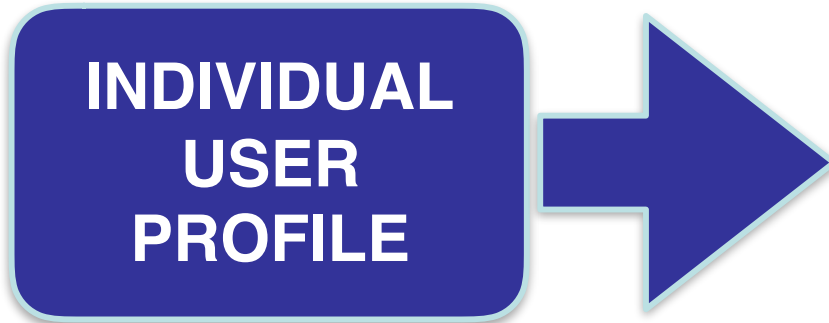
● Other Behaviours

- Processing of quality attributes
- Processing of time synchronization

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Nothing to Wait For....



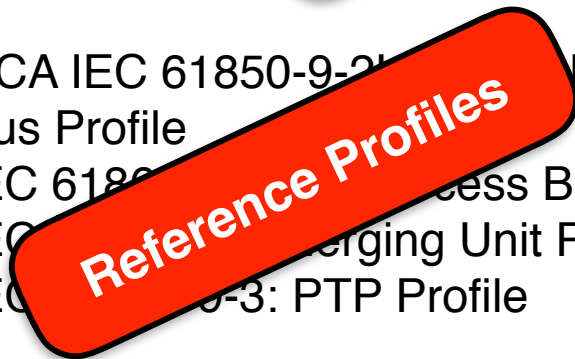
THIS COULD BE YOU.



IEC 61850-9-2:2009 Guideline for the Application of
IEC 61850-9-2:2009 Technical Report
IEC 61850-9-2:2009-103:2009 Technical Report
IEC 61850-9-2:2009-103:2009 Technical Report (Draft)



UCA IEC 61850-9-2:2009 Process
Bus Profile
IEC 61850-9-2:2009 Process Bus Profile
IEC 61850-9-2:2009 Process Bus Profile
IEC 61850-9-2:2009 Process Bus Profile
IEC 61850-9-2:2009 PTP Profile



Recommendations

1

DECOMPOSE PAC SCHEMES INTO A LIST OF IEC 61850 APPLICATIONS & PRIORITIZE THE ONES THAT WILL BE REPLICATED OVER THE LONG-TERM

2

IDENTIFY THE OPTIONAL IEC 61850 DATA MODEL ELEMENTS AND COMMUNICATION SERVICES THAT ARE REQUIRED TO BUILD THESE APPLICATIONS

3

DEVELOP A USER PROFILE FOR EACH APPLICATION USING THE IEC GUIDELINES AND IEC PRODUCT PROFILES AS A REFERENCE

4

COMPLETE A GAP ANALYSIS BETWEEN YOUR USER PROFILE AND VENDOR'S PRODUCTS. NOTIFY VENDORS OF THE REQUIRED FUNCTIONALITIES.

5

LOBBY SUPPORT FROM OTHER LIKE-MINDED USERS AND DEFINE A COMMON SUBSET OF FEATURES THAT CAN BE USED AS A BASIS FOR FUTURE IEC BAP

